

Response
Serial No. 10/705,881
Attorney Docket No. 032105

REMARKS

Rejection under 35 U.S.C. §102(a)

Claims 1-4, 13, 17, 21, 25, 29 and 33 were rejected under 35 U.S.C. 102(a) as being anticipated by Japanese Publication No. 2001-338976.

Applicants respectfully traverse the rejection.

Japanese Publication No. 2001-338976 is a document which is mentioned in the present application as background of the present invention. Japanese Publication No. 2001-338976 discloses a manufacturing method of a semiconductor device comprising: a first step of forming an insulation film 35 by thermal CVD on a silicon substrate 1 (see FIG 10 (d)); and a second step of forming the insulation film 38 under pressure lower than the first process without breaking vacuum (see FIG 11 (e)).

In Japanese Publication No. 2001-338976, as described in the present application, the insulation film is deposited with a first pressure of the inside of the deposition chamber, which is a little lower than the atmospheric pressure, the atmosphere in the deposition chamber is exhausted to set the pressure inside the deposition chamber to be a second pressure, and with the second pressure of the inside of the deposition chamber the insulation film is further deposited.

In Japanese Publication No. 2001-338976, as described in the present application, when the pressure inside the deposition chamber is set at the second pressure, the pressure inside the deposition chamber is extremely decreased, and additionally, the atmosphere inside the

deposition chamber becomes unstable. As a result, the insulation film is deposited in uneven thickness. According to the method of Japanese Publication No. 2001-338976, a film thickness distribution of the insulation film in the intra-plane of the semiconductor wafer is larger on one side of the semiconductor wafer and smaller on the other side of the semiconductor wafer. When the surface of the insulation film having such film thickness distributions polished by CMP, the difference between a maximum value and a minimum value of the film thickness of the inter-layer insulation film is further increased. Thus, in Japanese Publication No. 2001-338976, it is difficult to provide an inter-layer insulation film with a sufficiently flat surface.

On the other hand, according to the present invention, the pressure in the deposition chamber is gradually decreased from a first pressure to a second pressure which is lower than the first pressure, after the step of depositing an insulation film, before the step of further depositing the insulation film.

In the present invention, when the first pressure (see (2) in FIG 7 of the present application) inside the deposition chamber is decreased to the second pressure (see (4) in FIG 7 of the present application), the pressure inside the deposition chamber is gradually decreased (see (3) in FIG. 7 of the present application) to thereby prevent the pressure inside the deposition chamber from being extremely decreased to make the atmosphere inside the deposition chamber unstable. Thus, in the present invention, the insulation film of highly uniform film thickness is formed. Furthermore, according to the present invention, the intra-plane distribution of the insulation film is concentric. Therefore, in the present invention, increase of the film thickness

Response
Serial No. 10/705,881
Attorney Docket No. 032105

unevenness of the inter-layer insulation film can be suppressed when the surface of the insulation film is polished by CMP. Accordingly, the present invention can provide an insulation film with a sufficiently flat surface.

Therefore, Japanese Publication No. 2001-338976 neither teaches nor suggests such feature of the present invention “the pressure adjusting step of decreasing a pressure gradually in the deposition chamber from a first pressure to a second pressure which is lower than the first pressure.”

For at least these reasons, claim 1 patentably distinguishes over Japanese Publication No. 2001-338976. Claims 1-4, 13, 17, 21, 25, 29 and 33, depending from claim 1, also patentably distinguish over Japanese Publication No. 2001-338976 for at least the same reasons.

Thus, the 35 U.S.C. §102(a) rejection should be withdrawn.

New Claim 37

New claim 37 is added which also depends from claim 1. The recitations of claim 37 are supported in the specification from page 14, line 14 to page 16, line 8 of the present application.

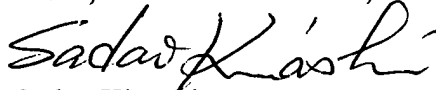
In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

Response
Serial No. 10/705,881
Attorney Docket No. 032105

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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